Digitized by the Internet Archive
in 2010 with funding from
Montana State Library

http://www.archive.org/details/montanaoutdoors4111969mont

Volume IV—No. 11 MONTANA FISH & GAME DEPARTMENT November, 1969

Report on the "Hot" Pheasants

By
FRANK H. DUNKLE,
STATE FISH AND GAME
DIRECTOR

Again the Montana Fish and Game Department has taken the initiative in alerting Montanans to a potential environmental hazard — mercury poisoning. Those of us who have been deeply concerned with the environment for a long time can't help but look back to a similar situation in the early 1950's when the department alerted the Montana public to dangers involved in large scale use of "hard" pesticides over vast areas of public land. We were branded by many as emotionalists meddling in affairs that did not concern us, and were even accused of opposing other phases of conservation. Now, the use of DDT is to be phased out nationwide.

This time the announcement was received differently. This time the department is not viewed as a collection of emotional alarmists. John Q. Citizen is now aware that all is not right in his environment. He is concerned, and a little scared!

In order to place the discovery of mercury contaminated game birds in its proper perspective, a brief review of the growth in pesticide uses may be in order. The entire picture is one of technological know-how outrunning technological understanding.

In the 1940's, the benefits of DDT drew world-wide acclaim in a matter of days. It was not until two decades later that the dangers and shortcomings of hard pesticides were recognized. For years, wildlife interests stood almost alone in their criticism of indiscriminate use of DDT, Dieldrin, Aldrin, and others.

In a report at a Pesticide and Public Health Seminar in Helena, Montana (1969), Thomas Mussehl made the following observations:

> Wildlife-pesticide problems in Montana have evolved through several stages. The initial stage in the 1950's might be called the 'Age of Innocence'. Large-scale pesticide applications were dogmatically carried out with their immediate, often single-purpose gains being the only obvious objective. Next followed a period of 'Questioning and Controversy' during the early 1960's. The book by the lady ecologist, Rachel Carson, helped trigger the controversy. Agencies and interest groups in Montana clashed severely over the mixed blessing of DDT spraying of forests and sagebrush removal with 2-4-D type chemicals. . .
>
> In 1964, the Fish and Game Commission announced a policy statement for the discontinuance of use of chlorinated hydrocarbons on public lands, a re-evaluation of the effects of herbicides, and the need for more public information about the total effects of pesticides. The U.S. Forest Service and Bureau of Land Management ceased use of DDT on Montana forests after 1963. This action must be looked upon as particularly commendable. It led to the present period of 'Research and Problem Solving'.

During the period when hard pesticides were being used extensively on public lands in Montana, the Fish and Game Department announced that their researchers had found high concentration of DDT residue in the flesh of blue grouse. Now we have had a number of pheasants and partridge assayed and most of them had high concentrations of mercury in their flesh. The full significance of these findings is not yet known, but a search of literature has bared some disturbing facts.

The hint that Montana birds might be contaminated with mercury actually originated in Canada. The **Lethbridge Herald** on September 12, 1969 ran the following article, "PHEASANT, PARTRIDGE HUNTING BAN SOUGHT — PUBLIC SAFETY HEALTH MEASURE BEHIND MOVE, by Joe Balla, Herald Managing Editor.

"A grim shakeup, and disbelief rocked Albertans today, following leakage of a highly confidential report to the Alberta government which says that hunting of pheasant and Hungarian Partridge should be banned as a public safety health measure.

Wildlife are generally the first indicators of environmental ills. Consequently, wildlife workers are often the first to recognize deteriorating environmental conditions.

"Pheasants and partridge, the only two birds that have been given close attention so far, are said to be carrying such a high residual build-up of pesticides and mercurial seed dressing compounds that they pose a real danger to health. . . "

A portion of another article in the **Lethbridge Herald** stated, "The wildlife officials had discovered high levels of mercury poison in a study on decreasing hawk populations. They traced the poison to pheasant and Hungarian partridge, on which some of the hawks prey. . . "

The Montana Fish and Game Department took immediate steps to check their wild game birds most apt to have gathered mercury residues. Some twenty samples of partridge and pheasants were sent to the Wisconsin Alumni Research Foundation Laboratory for assay. All were found to be carrying mercury residues and most were in excess of standards established by the World Health Organization.

I checked with Doctor Anderson, Executive Officer for the State Board of Health, as to the implications of these findings. He stated, "I do not believe there is any danger in consuming Montana pheasants. By this I mean there would be no acute mercurial toxic effects." Doctor Anderson, however, felt that there is not adequate knowledge at this time to afford an evaluation of chronic effects.

Subsequent search for material has shown that information from U. S. sources are indeed wanting and even contradictory. Extensive research has been done abroad, especially in Sweden. The result of research has been almost complete abandonment of mercury uses for agriculture in some countries. Swedish manufactures of mercury products, however, find a ready market for their products in the U.S. where there is practically no information available regarding the extent of mercury contamination of food and the general environment. One of the most toxic of mercury compounds that was a popular seed dressing once in Sweden, "Panogen", is now very popular in the U. S. The material is both imported and manufactured at home.

Because they are very effective killers of fungi, mercury compounds are widely used in the United States to treat seed grains. Other uses are as mold inhibitors in lawns, in paints, in wood pulp, and they are used in many other industrial processes.

Japan, a country that has been the largest consumer of mercury compounds, has had problems beginning in 1953. From 1953 to 1960, 110 people were either killed or crippled in Minamata, Japan as a result of mercury poisoning. The worst outbreak of mercury poisoning in Minamata occurred in 1961. At that time, 88 persons were affected by mercury poisoning; 35 of those persons died. The 53 survivors were invalids for life. The source of mercury in these cases was traced to contaminated shellfish that were being caught in Minamata Bay. Concentrations of mercury in these shellfish ranged from 27 to 102 parts per million with an average concentration of 50 parts per million in the flesh of shellfish. The mercury was reaching Minamata Bay through the effluent of several plastics plants that were located on the bay and discharging mercury bearing effluent into the bay. In 1965 in Niigata, Japan, 120 persons reported ill with mercury poisoning symptoms. Investigations in this case revealed large quantities of fish were being consumed with from 5 to 20 parts per milion mercury in fish flesh. Medical observations in Niigata revealed that 2.4 parts per milion of mercury in human blood appeared to be the action level at which mercury poisoning symptoms appeared in infected individuals.

A frightening aspect of mercury compounds is that they may possibly

MONTANA OUTDOORS

Published monthly by the Montana Fish and Game Dept., Mitchell Building, 125 Roberts St., Helena, Montana 59601.

Second class postage rates paid at Helena, Montana 59601.

be absorbed and distributed through a growing plant so that some mercury will appear in the harvested food. An inquiry of a Montana agricultural expert has drawn a flat denial that this occurs. On the other hand, extensive and documented experiments in Sweden concluded that it is so, and led to strict curtailment of mercury use in agriculture there and elsewhere. The experimental evidence was summarized by a British scientists in the 1968 volume 23 of "Residue Reviews" (Springer-Verlay, New York). The U. S. Department of Agriculture, now investigating the translocation of mercury from seeds to grain, questions the occurrence of translocation, though their experiments have not yet been completed.

It would appear that there is yet much investigation to be done in the United States before there is a clear cut picture of the mercuric fungicides in foods. Apparently, wheat is the only food being monitored for mercury by the U. S. Department of Agriculture. The tragedy of thalidomyde, the drenching of the earth with hard pesticides, the recent alarm over cyclomates leaves us somewhat shaken and questioning the effectiveness of current food and drug controls. One would be naive indeed to feel that he is being completely safeguarded against contaminants.

The system of setting "tolerances," or permissive amounts of poisonous residues in foodstuffs is in itself difficult to understand. For example, the Food and Drug Administration has set a zero tolerance on many poisons. One would imagine, then, that a zero tolerance would mean that there could be **no** mercury compounds allowable in foodstuffs. Scientists tell us, however, that our planet and its atmosphere have been so thoroughly contaminated with pesticides that it is possible to find pesticides in foods even where the pesticides have not been used. As reported in the May issue of **Environment**, "Mercury, once released tends to wander and undergo complex transformations. In almost all of the compounds being used, but particularly the organic forms of mercury used in agriculture, the mercury can vaporize and be carried considerable distances by the wind before being brought down again by dust-fall or rain." A zero tolerance under this condition is essentially not practical and in cases impossible. Accordingly, the Department of Agriculture and Health Education and Welfare will abandon the zero tolerance by the end of 1970. Until that time, the zero tolerance will only mean that there should be no increase beyond the average levels of the materials already in foods — whatever these averages may be.

Perhaps I have seemed to wander afield in this article, but the fact is that wildlife is inescapably tied to the environment, often by very fragil bonds. Any factor that affects the environment must affect fish and game and people. Wildlife agencies have long contended that a suitable environment for wildlife is a quality environment for man. It is a fact also that our game birds, some of them at least, are contaminated with mercury. It is assumed that the mercury was picked up by birds feeding on treated seed grain. I do not pretend to know the implications of our findings, and it is impossible to predict future developments. This department will, however, continue to report to Montana citizens any problems that may have a major effect on wildlife and its environment.

Following are assay reports on the partridge and pheasants which we had tested.

ASSAY REPORT

Analysis for MERCURY
Method — Mercury Ref. The Analyst 86, 608, (1961) modified by Atomic absorption spectrophotometry with Boat technique.
Submitted by — State of Montana Dept. of Fish and Game
Claimed Content — (Each figure represents an individual bird.)

Pondera Co., East of Conrad	0.15 ppm
Teton Co., T26N, R4W, Sec. 11	0.27 ppm
Teton Co., T26N, R4W, Sec. 30	0.07 ppm
Teton Co., T22N, R4W, Sec. 11	0.17 ppm
Teton Co., T22N, R3W, Sec. 34	0.30 ppm
Pease Bottom Yellowstone River	0.05 ppm
Hysham Bench	0.05 ppm
Buffalo Rapids, Glendive, Montana	0.31 ppm
Kinsing 22 mi. NE of Miles City	0.09 ppm
Lower Tongue River Beets fields and River Bottom	0.05 ppm
5 mi. So. of Hardin, Mont.	0.30 ppm
Lower Musselshell Valley East of Roundup	0.47 ppm
6 miles S. E. of Columbus, Montana	0.05 ppm
½ mi. east of Edgar, Mont.	0.30 ppm
Big Coulee S. W. of Lavine	0.05 ppm
Blaine Co., Mont. So. of Chinook	0.38 ppm
Blaine Co., Mont. Road	0.20 ppm
Richland Co., So. of Crane, Montana	0.09 ppm
Phillips Co.	0.15 ppm
South Phillips Co.	0.11 ppm

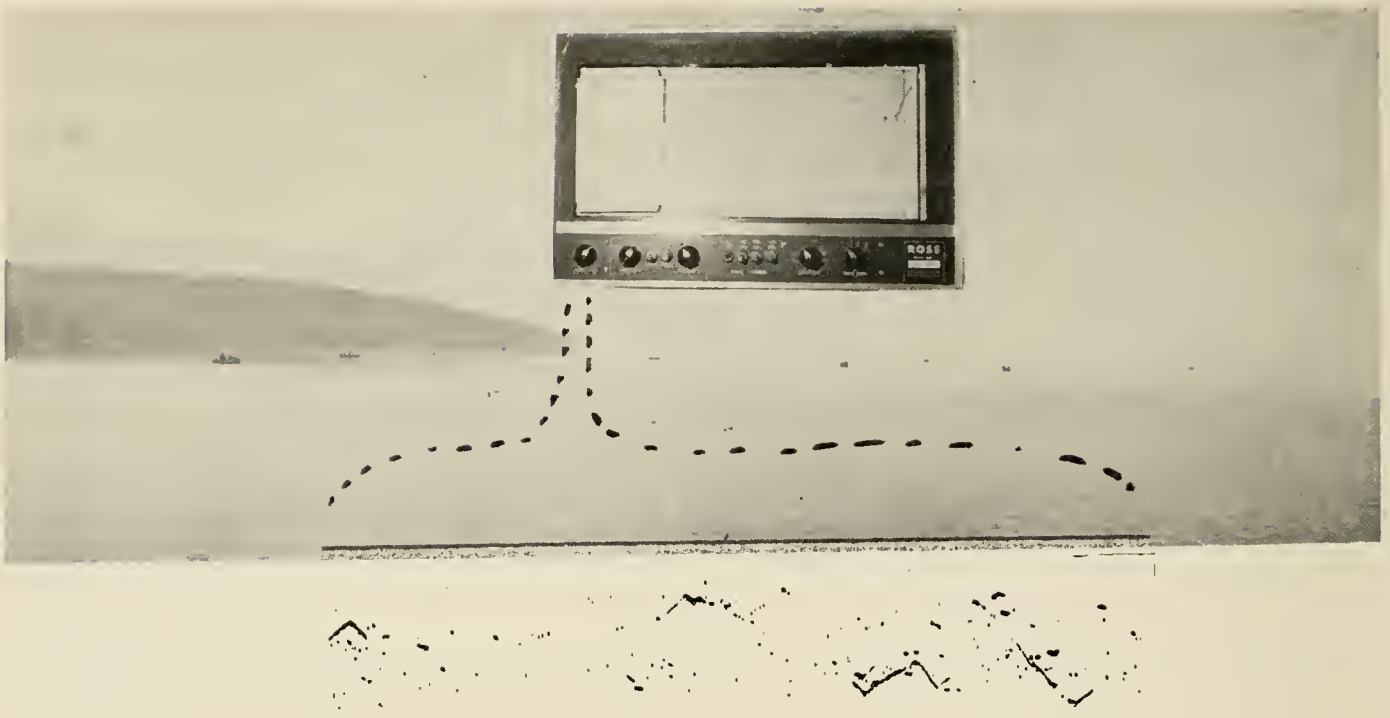
Frank H. Dunkle

Fish Watching in Flathead Lake

Kokanee salmon have provided Flathead Lake fishermen with a great deal of recreation for some twenty years now. They have provided a lot ot head-scratching mystery too, for both fishermen and fish managers. One of the mysteries is their whereabouts in the lake at certain times of the year. The salmon at times seem to all but disappear, only to reappear in force at another time, or another site.

Fisheries biologists have had their theories about the somewhat predictable comings and goings of kokanee, but until the last couple of years, they have not had the equipment to cope with gargantuan Flathead Lake. Tackling Flathead with standard inland equipment would be like sicking a mouse onto a cat. Flathead covers 197 square miles at high water. It is about 28 miles long and varies from 4 to 14 miles wide. There are 22 islands in the lake that range from less than 1 acre to 2,700 acre Wildhorse Island. The maximum depth is around 420 feet near Yellow Bay. In addition to the lake proper, the denizens of Flathead can range far upstream into the river and tributaries and for a short distance into the Swan River.

As a part of an overall lake study, a year 'round sampling program was begun on Flathead Lake in May, 1967. Sampling was done periodically at 22 separate sites that were felt to be representative of the overall lake. The program was designed primarily to sample for fish, but also included water quality measure-



To the human eye, this was merely a peaceful scene of fishermen on Flathead Lake. To the electronic instrument in the fish and game's research boat, the scene was much different. Its echogram recorded the antics of kokanee beneath the boat. The dots below the water line show individual fish. The lines are fish that remained in the sonar cone below the boat but changed depth.

ments, water temperatures at various depths, sampling for plankton, and sampling for bottom organisms. Nine of the sampling stations were in shallow water less than 50 feet deep, 11 in medium water from 50 to 150 feet, and two were in water over 150 feet deep. Fish samples were collected by the use of gill nets, nets of light thread in which fish become entangled when they attempt to get through. Electronic sonar equipment was used for checking on the placement and alignment of the net sets and for checking the depth and general distribution of fish. Various fish species, and even their approximate sizes can be determined fairly accurately by comparing catches made in the gill nets and recordings made by sonar equipment.

Fishermen will benefit directly from this research by studying the movements of kokanee as they are affected by changes in water temperatures.

Summer

Kokanee concentrations were absent from the northern half of the lake until May, when they progressively moved northward and out into most areas of the lake. During July, kokanee were spread over the entire southern two-thirds of the lake. They were concentrated in a layer of water between 24 and 40 feet below the surface. Water temperature range for kokanee from 52 degrees to 57 degrees Fahrenheit. A number of large lake trout, large Dolly Varden and also lake whitefish were found to have moved onto the delta bar at this time in water from 60 to 90 feet deep. This was off the mouth of Flathead River. Kokanee were found directly above the bar. During this same period, the rough fish (squawfish, longnose suckers, peamouths, and redsided shiers) were starting to concentrate along shore areas and none were found in waters deeper than 90 feet. The lake water was beginning to stratify, or become layered with each water layer representing rather definite water temperatures. As surface temperatures warmed in Au-

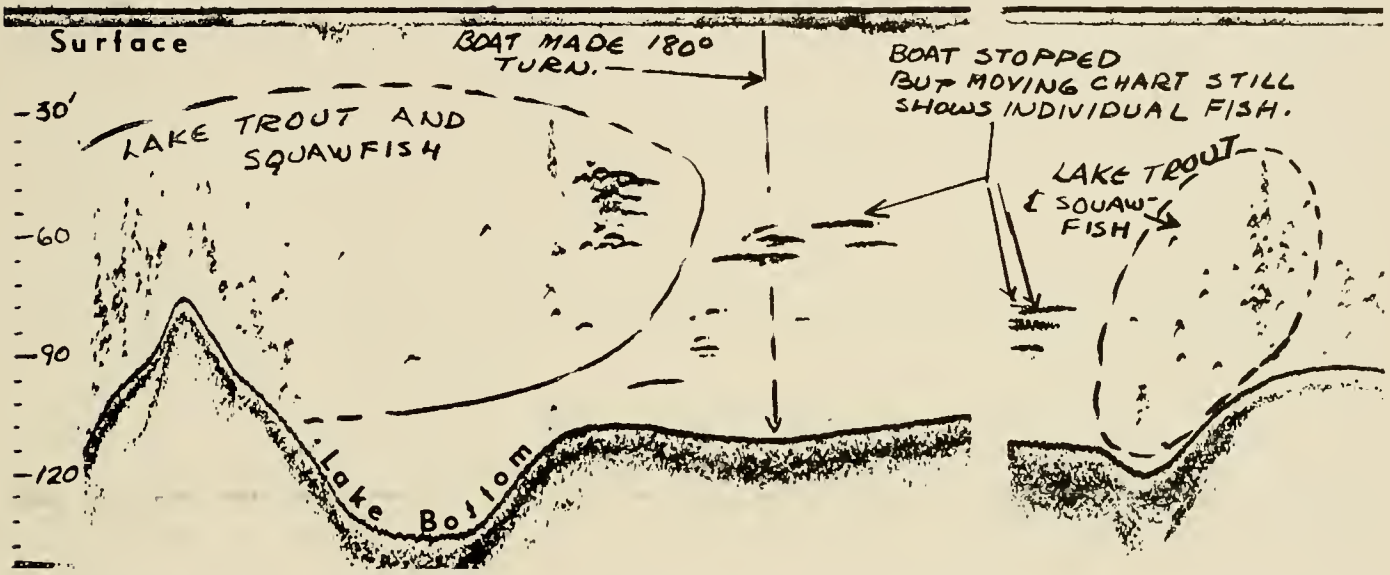
This catch of fish by gill nets included Lake Trout, Lake Whitefish, and Dolly Varden.

gust, kokanee became more concentrated in water 36 to 48 feet deep. They were obviously going deeper to stay in cooler water.

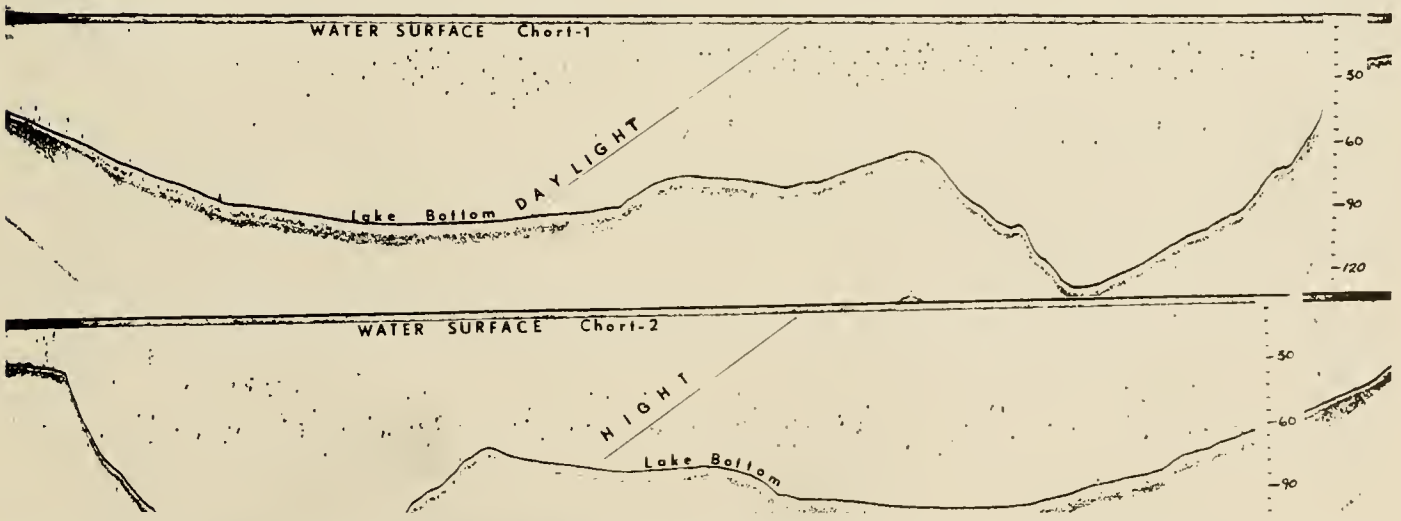
In September surface temperatures of Flathead Lake began to cool; however, the deepest layer of cold water continued to go down about another 10 feet in the lake. The concentration of kokanee again went to lower depths and was found between 42 and 60 feet. The first run of mature kokanee then entered the lower portions of the Flathead River. Two other large concentrations were located off the mouths of the Swan and Flathead Rivers.

From November through December, the lake cooled slowly and temperatures became equalized from top to bottom and throughout the lake. The last spawning salmon were found in early December in the lower parts of the Flathead River and in the spawning areas of the northern half of the lake. The largest concentrations of mature kokanee continued to congregate near the mouths of the Swan and Flathead Rivers. Heavily used shoreline areas were primarily in Woods, Yellow and Skidoo Bays. The wide spread spawning of salmon attracted Dolly Varden. The predacious Dollies fed heavily upon dying salmon.

The annual movements of kokanee is but one of the many important aspects of the Flathead Lake study. It is of special interest to fishermen as we can now reliably predict in which parts of the lake and at which depths they may most profitably spend their fishing efforts.



Considerable experience is required to correctly interpret graphs (echograms) recorded by the sonar equipment. The fairly straight line at the top is the lake surface. The disrupted areas show water turbulence. Irregular line at the bottom is the lake bottom. Chart at left shows water depth.



The two echograms below contradict the belief of most fishermen. The kokanee, shown as scattered dots, are nearer the lake surface during the day and deeper at night. Reverse images of the lake bottom contours are the result of the boat moving in opposite directions when the two sonar recordings were made.

The Other Foot

The following letter appeared in the October 30th issue of the Carbon County News, Red Lodge, Montana. It was written by Al Herem, a concerned sportsman and one of the more than 800 volunteer hunter safety instructors in the state. These people give freely of their time and effort, without receiving any pay, to instruct the youth of Montana in the safe handling of firearms and also in basic good sportsmanship and other related subjects.

The letter is addressed to the "property owners of Carbon County," but it could well be addressed to all Montana property owners. The concern expressed by Mr. Herem is shared by many hunter safety instructors as well as other sportsmen throughout the State.

> "To the Property owners of Carbon County:
>
> "Each year more NO HUNTING signs appear on property owner's fences and less signs reading NO HUNTING WITHOUT PERMISSION. I realize that a few careless meat heads are responsible for this, however, as a volunteer instructor for the Fish & Game Dept., Safe Gun Handling section, I teach each student to respect not only his rifle or shotgun, but respect for owners of property as well. They are taught to ask permission before hunting on any man's property, posted or not.
>
> "Each year several come home disappointed because they were treated rudely by land owners and refused permission to hunt. Think it over, does the shoe fit? Next time a young boy or girl shows up, why not give him or her a chance to prove themselves. Or you can poke a finger in his eye and ask if he can read or just stare and give him the silent treatment. This will discourage him enough to where he may forget his rod or gun and go drag racing down Broadway and won't bother you next season. Which brings to mind, you must remember to sign your own son or daughter up for the Hunter Safety Course, so he can get a license to hunt next season!
>
> "To you good people who have given my students a chance to hunt, all I can say is 'Thanks. We need more like you.' Al Herem, Red Lodge."

After this letter was published, Mr. Herem received many phone calls from local ranchers telling him that his students would be welcome to hunt on their property. It appears that this problem, like most of the problems in the world, could be settled by just a little better communication and more understanding. Perhaps may landowners who have posted their lands in a burst of righteous indignation against a careless hunter haven't stopped to consider the disappointment such action brings to the well-intentioned considerate hunters of tomorrow. Good relations between landowners and sportsmen must involve consideration and understanding on both sides.

Permits Available for "MAC MALLARD"

Free permits are being issued to gunners who want to hunt ducks during the special drake mallard season in the Central Flyway portion of Montana from December 13 through January 4. The permits may be picked up in person or received through the mail from a fish and game office. Persons need only give their names, addresses, and numbers of their 1969 Montana bird licenses. Waterfowl hunters are, of course, required to have the federal duck stamp also.

The special season will be from December 13 through January 4 in the Central Flyway portion of Montana only. This includes Blaine, Fergus, Judith Basin, Wheatland, Sweet Grass, Stillwater and Carbon Counties and all counties lying east of these. Hunting hours will be from sunrise to sunset. Means of taking will be the same as during the regular waterfowl season, but the bag limit will be based on a point system —so many points for each bird shot, depending upon the species and sex of the waterfowl.

During the special season, a mallard drake will count as 10 points and a mallard hen or any other species of duck (including coots and mergansers) will count as 40 points. When the hunter's last bird brings his total to 40 points or more, he's through hunting for the day. For example, he might have four mallard drakes for a total of 40 points. If his first bird is a mallard hen or any other species of ducks, then he's got his daily limit of 40 points. He may shoot three mallard drakes for a total of 30 points and then round out the limit with another species of duck or a 40 point mallard hen which would give him a maximum total of 70 points. The possession limit will be two legal daily limits.

The point system was tried for the first time last season in a small Colorado Valley and seemed to work well. It is designed to help the hunter by allowing him to stay within the law if he shoots some kind of duck that he didn't intend to, or if he has difficulty in indentifying ducks on the wing. At the same time, it offers a bonus of more birds to the hunter who is able to identify his target correctly. Another advantage is that it can selectively and purposely put the bulk of hunting pressure on a desired species and sex of waterfowl.

The point system allows the hunter to make an honest mistake without breaking the law. In making recommendations for the special season, waterfowl biologists from Montana, Wyoming, Colorado, Nebraska and New Mexico stated "The drake-only experiment in 1968 indicated that illegal species and sexes made up as much as 10 per cent of the total kill. Thus, even though performance checks revealed that hunters demonstrated restraint in selecting targets, a number of birds other than mallard drakes were taken. Have we, therefore, placed the hunter in a position of breaking the law when he had no intention of doing so? Can the point-system bag reduce the illegal kill without measurably increasing the harvest of birds other than target species—in this case mallard drakes?" Our special season this winter will help answer these questions.

The mallard drake is probably the most commonly recognized duck in the United States. It is the ancestor of most of our domestic ducks. The wide range of the mallard coupled with its adaptability to civilization has made it one of our more stable waterfowl species. Mallards along the east slopes of the Rockies do not join the main streams of Central Flyway duck migrations. Consequently, these particular birds don't take much hunting pressure. The special late mallard drake season should provide waterfowl hunters with a great deal of recreation while not affecting the overall welfare of the mallard populations.

We'll give you our emblem

If you'll give us your support.

I want that shoulder patch—and I want cleaner fishing waters, too. Here's my tax-deductible contribution of $_____

NAME _____

STREET _____

CITY _____ STATE _____ ZIP _____

TO: **SPORT FISHERY RESEARCH FOUNDATION**
Suite 503, 719 13th Street, N.W.
Washington, D.C. 20005

We'd like to make a deal.

Send us five dollars or more, and we'll send you the official Sport Fishery Research Foundation shoulder patch.

Plus something else.

We'll also give you our guarantee that every dollar we receive will help to make fishing a lot better. For you. And for every other angler in the country, too.

Your contribution finances University Fellowships in Fishery Science — the grants that are producing scientists, biologists, and a small army of other experts dedicated to cleaning up our fishing streams. Restocking our fished-out lakes. And finding and eliminating the industrial pollutants that are fouling up our waters.

That's the only place your money goes. Not a penny is spent on "side expenses." The long-established Sport Fishing Institute defrays all the administrative costs involved in running a program like this.

Just send us your tax-deductible check today. $5.00—or more—gets you our handsome emblem.*

And also our sincere thanks for helping to improve everybody's fishing fun.

Including your own.

New Fish and Game Commissioner

Patrick J. McDonough of Billings has been appointed to the Montana Fish and Game Commission to represent Fish and Game District 5. Governor Anderson made the appointment to fill a vacancy left open when commissioner Robert Wilson of Hardin resigned. Wilson had accepted an appointment as district judge.

McDonough, an independent oilman in Billings, was born in Missoula and holds a degree from the University of Montana as well as a U.M. law school degree. He served with the marines in both World War II and the Korean War. He is a member of the Sierra Club and has long had an interest in conservation.

Mr. McDonough will represent Golden Valley, Musselshell, Stillwater, Carbon, Yellowstone, Big Horn, Treasure, Rosebud, Custer, Powder River, Carter, Fallon and Prairie Counties.

Photo courtesy of the
Billings Gazette

MONTANA
FISH AND GAME DEPARTMENT

HELENA, MONTANA 59601

Address Correction Requested

3

MONTANA OUTDOORS

Published monthly by the Montana Fish and Game Dept., Mitchell Building, 125 Roberts St., Helena, Montana 59601.
Second class postage rates paid at Helena, Montana 59601.

NOVEMBER, 1969